



SEQUENCE LISTING

<110> Hitz, William
Sebastian, Scott
Grace, John
Streit, Leon

<120> SOYBEAN PLANT PRODUCING SEEDS WITH REDUCED LEVELS OF RAFFINOSE
SACCHARIDES AND PHYTIC ACID

<130> BB-1077-C

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<150> 08/835,751

<151> APRIL 8, 1997

<150> PCT/US98/06822

<151> APRIL 7, 1998

<160> 16

<170> Microsoft Office 97

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<212> DNA

<213> Glycine max

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			20					25					30			
His	Glu	Asn	Arg	Asn	Gly	Thr	Tyr	Gln	Trp	Ile	Val	Lys	Pro	Lys	Ser	
		35					40					45				
Val	Lys	Tyr	Glu	Phe	Lys	Thr	Asn	Ile	His	Val	Pro	Lys	Leu	Gly	Val	
	50					55					60					
Met	Leu	Val	Gly	Trp	Gly	Gly	Asn	Asn	Gly	Ser	Thr	Leu	Thr	Gly	Gly	
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			85						90					95		
Gln	Gln	Ala	Asn	Tyr	Phe	Gly	Ser	Leu	Thr	Gln	Ala	Ser	Ala	Ile	Arg	
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Ile	Asp	Leu	Gln	Lys	Gln	Leu	Arg	Pro	Tyr	Met	Glu	Ser	Met	Leu	Pro	
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Asn	Glu	Ala	Glu	Ile	Ser	Pro	Ser	Thr	Leu	Tyr	Ala	Ile	Ala	Cys	Val	
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Asp Asp Phe Lys Ser Gly Gln Thr Lys Met Lys Ser Val Leu Val Asp 305 310 315 320		
Phe Leu Val Gly Ala Gly Ile Lys Pro Thr Ser Ile Val Ser Tyr Asn 325 330 335		
His Leu Gly Asn Asn Asp Gly Met Asn Leu Ser Ala Pro Gln Thr Phe 340 345 350		
Arg Ser Lys Glu Ile Ser Lys Ser Asn Val Val Asp Asp Met Val Asn 355 360 365		
Ser Asn Ala Ile Leu Tyr Glu Pro Gly Glu His Pro Asp His Val Val 370 375 380		
Val Ile Lys Tyr Val Pro Tyr Val Gly Asp Ser Lys Arg Ala Met Asp 385 390 395 400		
Glu Tyr Thr Ser Glu Ile Phe Met Gly Gly Lys Ser Thr Ile Val Leu 405 410 415		
His Asn Thr Cys Glu Asp Ser Leu Leu Ala Ala Pro Ile Ile Leu Asp 420 425 430		
Leu Val Leu Leu Ala Glu Leu Ser Thr Arg Ile Glu Phe Lys Ala Glu 435 440 445		
Asn Glu Gly Lys Phe His Ser Phe His Pro Val Ala Thr Ile Leu Ser 450 455 460		
Tyr Leu Thr Lys Ala Pro Leu Val Pro Pro Gly Thr Pro Val Val Asn 465 470 475 480		
Ala Leu Ser Lys Gln Arg Ala Met Leu Glu Asn Ile Met Arg Ala Cys 485 490 495		
Val Gly Leu Ala Pro Glu Asn Asn Met Ile Leu Glu Tyr Lys 500 505 510		

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<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic oligonucleotide

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35

<210> 4

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic oligonucleotide

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<210> 5

<211> 1533

<212> DNA

<213> Glycine max

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gttattgcta	accgagaggg	catttcacgc	gctacaaagg	acaagattca	acaagccaat	300
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<210> 6

<211> 510

<212> PRT

<213> Glycine max

<400> 6

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			20					25					30		
His	Glu	Asn	Arg	Asn	Gly	Thr	Tyr	Gln	Trp	Ile	Val	Lys	Pro	Lys	Ser
		35				40						45			
Val	Lys	Tyr	Glu	Phe	Lys	Thr	Asn	Ile	His	Val	Pro	Lys	Leu	Gly	Val
	50					55					60				
Met	Leu	Val	Gly	Trp	Gly	Gly	Asn	Asn	Gly	Ser	Thr	Leu	Thr	Gly	Gly
65					70					75				80	

Val	Ile	Ala	Asn	Arg	Glu	Gly	Ile	Ser	Trp	Ala	Thr	Lys	Asp	Lys	Ile	85	90	95
Gln	Gln	Ala	Asn	Tyr	Phe	Gly	Ser	Leu	Thr	Gln	Ala	Ser	Ala	Ile	Arg	100	105	110
Val	Gly	Ser	Phe	Gln	Gly	Glu	Glu	Ile	Tyr	Ala	Pro	Phe	Lys	Ser	Leu	115	120	125
Leu	Pro	Met	Val	Asn	Pro	Asp	Asp	Ile	Val	Phe	Gly	Gly	Trp	Asp	Ile	130	135	140
Ser	Asn	Met	Asn	Leu	Ala	Asp	Ala	Met	Ala	Arg	Ala	Lys	Val	Phe	Asp	145	150	155
Ile	Asp	Leu	Gln	Lys	Gln	Leu	Arg	Pro	Tyr	Met	Glu	Ser	Met	Leu	Pro	165	170	175
Leu	Pro	Gly	Ile	Tyr	Asp	Pro	Asp	Phe	Ile	Ala	Ala	Asn	Gln	Glu	Glu	180	185	190
Arg	Ala	Asn	Asn	Val	Ile	Lys	Gly	Thr	Lys	Gln	Glu	Gln	Val	Gln	Gln	195	200	205
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Val	Gly	Leu	Asn	Asp	Thr	Met	Glu	Asn	Leu	Leu	Ala	Ala	Val	Asp	Arg	245	250	255
Asn	Glu	Ala	Glu	Ile	Ser	Pro	Ser	Thr	Leu	Tyr	Ala	Ile	Ala	Cys	Val	260	265	270
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Pro	Gly	Leu	Ile	Asp	Leu	Ala	Ile	Ala	Arg	Asn	Thr	Leu	Ile	Gly	Gly	290	295	300
Asp	Asp	Phe	Lys	Ser	Gly	Gln	Thr	Lys	Met	Lys	Ser	Val	Leu	Val	Asp	305	310	315
Phe	Leu	Val	Gly	Ala	Gly	Ile	Lys	Pro	Thr	Ser	Ile	Val	Ser	Tyr	Asn	325	330	335
His	Leu	Gly	Asn	Asn	Asp	Gly	Met	Asn	Leu	Ser	Ala	Pro	Gln	Thr	Phe	340	345	350
Arg	Ser	Lys	Glu	Ile	Ser	Lys	Ser	Asn	Val	Val	Asp	Asp	Met	Val	Asn	355	360	365
Ser	Asn	Ala	Ile	Leu	Tyr	Glu	Pro	Gly	Glu	His	Pro	Asp	His	Val	Val	370	375	380
Val	Ile	Lys	Tyr	Val	Pro	Tyr	Val	Gly	Asp	Ser	Asn	Arg	Ala	Met	Asp	385	390	395
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Glu Tyr Thr Ser Glu Ile Phe Met Gly Gly Lys Ser Thr Ile Val Leu
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 His Asn Thr Cys Glu Asp Ser Leu Leu Ala Ala Pro Ile Ile Leu Asp
 420 425 430
 Leu Val Leu Leu Ala Glu Leu Ser Thr Arg Ile Glu Phe Lys Ala Glu
 435 440 445
 Asn Glu Gly Lys Phe His Ser Phe His Pro Val Ala Thr Ile Leu Ser
 450 455 460
 Tyr Leu Thr Lys Ala Pro Leu Val Pro Pro Gly Thr Pro Val Val Asn
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 Ala Leu Ser Lys Gln Arg Ala Met Leu Glu Asn Ile Met Arg Ala Cys
 485 490 495
 Val Gly Leu Ala Pro Glu Asn Asn Met Ile Leu Glu Tyr Lys
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<210> 7
 <211> 16
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: synthetic oligonucleotide

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<210> 8
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 <212> DNA
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<220>
 <223> Description of Artificial Sequence: synthetic oligonucleotide

<400> 8
 cgtaggggac agcaat 16

<210> 9
 <211> 1533
 <212> DNA
 <213> Glycine max

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<210> 10

<211> 510

<212> PRT

<213> Glycine max

<400> 10

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          20                      25          30

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His Glu Asn Arg Asn Gly Thr Tyr Gln Trp Ile Val Lys Pro Lys Ser
          35                      40          45

```

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Val Lys Tyr Glu Phe Lys Thr Asn Ile His Val Pro Lys Leu Gly Val
          50                      55          60

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Met Leu Val Gly Trp Gly Gly Asn Asn Gly Ser Thr Leu Thr Gly Gly
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Val Ile Ala Asn Arg Glu Gly Ile Ser Trp Ala Thr Lys Asp Lys Ile
          85                      90          95

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Gln Gln Ala Asn Tyr Phe Gly Ser Leu Thr Gln Ala Ser Ala Ile Arg
          100                     105          110

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Val Gly Ser Phe Gln Gly Glu Glu Ile Tyr Ala Pro Phe Lys Ser Leu
          115                     120          125

```

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Leu Pro Met Val Asn Pro Asp Asp Ile Val Phe Gly Gly Trp Asp Ile
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Ser Asn Met Asn Leu Ala Asp Ala Met Ala Arg Ala Lys Val Phe Asp
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Ile Asp Leu Gln Lys Gln Leu Arg Pro Tyr Met Glu Ser Met Leu Pro
          165                     170          175

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Leu Pro Gly Ile Tyr Asp Pro Asp Phe Ile Ala Ala Asn Gln Glu Glu
          180                     185          190

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```

Arg Ala Asn Asn Val Ile Lys Gly Thr Lys Gln Glu Gln Val Gln Gln
          195                     200          205

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Ile	Ile	Lys	Asp	Ile	Lys	Ala	Phe	Lys	Glu	Ala	Thr	Lys	Val	Asp	Lys		
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Val	Val	Val	Leu	Trp	Thr	Ala	Asn	Thr	Glu	Arg	Tyr	Ser	Asn	Leu	Val		
225					230					235					240		
Val	Gly	Leu	Asn	Asp	Thr	Met	Glu	Asn	Leu	Leu	Ala	Ala	Val	Asp	Arg		
				245					250					255			
Asn	Glu	Ala	Glu	Ile	Ser	Pro	Ser	Thr	Leu	Tyr	Ala	Ile	Ala	Cys	Val		
			260					265						270			
Met	Glu	Asn	Val	Pro	Phe	Ile	Asn	Gly	Ser	Pro	Gln	Asn	Thr	Phe	Val		
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Pro	Gly	Leu	Ile	Asp	Leu	Ala	Ile	Ala	Arg	Asn	Thr	Leu	Ile	Gly	Gly		
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His	Leu	Gly	Asn	Asn	Asp	Gly	Met	Asn	Leu	Ser	Ala	Pro	Gln	Thr	Phe		
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Ser	Asn	Ala	Ile	Leu	Tyr	Glu	Pro	Gly	Glu	His	Pro	Asp	His	Val	Val		
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His	Asn	Thr	Cys	Glu	Asp	Ser	Leu	Leu	Ala	Ala	Pro	Ile	Ile	Leu	Asp		
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Leu	Val	Leu	Leu	Ala	Glu	Leu	Ser	Thr	Arg	Ile	Glu	Phe	Lys	Ala	Glu		
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Tyr	Leu	Thr	Lys	Ala	Pro	Leu	Val	Pro	Pro	Gly	Thr	Pro	Val	Val	Asn		
465					470					475					480		
Ala	Leu	Ser	Lys	Gln	Arg	Ala	Met	Leu	Glu	Asn	Ile	Met	Arg	Ala	Cys		
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Val	Gly	Leu	Ala	Pro	Glu	Asn	Asn	Met	Ile	Leu	Glu	Tyr	Lys				
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<210> 11

<211> 1533

<212> DNA

<213> Glycine max

<400> 11

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<210> 12

<211> 510

<212> PRT

<213> Glycine max

<400> 12

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Glu Thr Glu Ile Gln Ser Val Tyr Asn Tyr Glu Thr Thr Glu Leu Val
      20                      25                      30

His Glu Asn Arg Asn Gly Thr Tyr Gln Trp Ile Val Lys Pro Lys Ser
      35                      40                      45

Val Asn Tyr Gln Phe Lys Thr Asn Thr His Val Pro Lys Leu Gly Val
      50                      55                      60

Met Leu Val Gly Trp Gly Gly Asn Asn Gly Ser Thr Leu Thr Gly Gly
      65                      70                      75                      80

Val Ile Ala Asn Arg Glu Asp Ile Ser Trp Ala Thr Lys Asp Lys Ile
      85                      90                      95

Gln Gln Ala Asn Tyr Phe Gly Ser Leu Thr Gln Ala Ser Ala Ile Arg
      100                      105                      110

Val Gly Ser Phe Gln Gly Glu Glu Ile Tyr Ala Pro Phe Lys Ser Leu
      115                      120                      125
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Leu	Pro	Met	Val	Asn	Pro	Asp	Asp	Ile	Val	Phe	Gly	Gly	Trp	Asp	Ile		
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Ser	Asn	Met	Asn	Leu	Ala	Asp	Ala	Met	Ala	Arg	Ala	Lys	Val	Phe	Asp		
145					150					155					160		
Ile	Asp	Leu	Gln	Lys	Gln	Leu	Arg	Pro	Tyr	Met	Glu	Ser	Met	Val	Pro		
				165					170					175			
Leu	Pro	Gly	Ile	Tyr	Asp	Pro	Asp	Phe	Ile	Ala	Ala	Asn	Gln	Glu	Glu		
			180					185					190				
Arg	Ala	Asn	Asn	Val	Ile	Lys	Gly	Thr	Lys	Gln	Glu	Gln	Val	Gln	Gln		
		195					200					205					
Ile	Ile	Lys	Asp	Ile	Lys	Ala	Phe	Lys	Glu	Ala	Thr	Lys	Val	Asp	Lys		
	210					215					220						
Val	Val	Val	Leu	Trp	Thr	Ala	Asn	Thr	Glu	Arg	Tyr	Ser	Asn	Leu	Val		
225					230					235					240		
Val	Gly	Leu	Asn	Asp	Thr	Met	Glu	Asn	Leu	Leu	Ala	Ala	Val	Asp	Arg		
				245					250					255			
Asn	Glu	Ala	Glu	Ile	Ser	Pro	Ser	Thr	Leu	Tyr	Ala	Ile	Ala	Cys	Val		
			260					265					270				
Met	Glu	Asn	Val	Pro	Phe	Ile	Asn	Gly	Ser	Pro	Gln	Asn	Thr	Phe	Val		
		275					280					285					
Pro	Gly	Leu	Ile	Asp	Leu	Ala	Ile	Ala	Arg	Asn	Thr	Leu	Ile	Gly	Gly		
	290					295					300						
Asp	Asp	Phe	Lys	Ser	Gly	Gln	Thr	Lys	Met	Lys	Ser	Val	Leu	Val	Asp		
305					310					315					320		
Phe	Leu	Val	Gly	Ala	Gly	Ile	Lys	Pro	Thr	Ser	Ile	Val	Ser	Tyr	Asn		
				325					330					335			
His	Leu	Gly	Asn	Asn	Asp	Gly	Met	Asn	Leu	Ser	Ala	Pro	Gln	Thr	Phe		
			340					345					350				
Arg	Ser	Lys	Glu	Ile	Ser	Lys	Ser	Asn	Val	Val	Asp	Asp	Met	Val	Asn		
		355					360					365					
Ser	Asn	Ala	Ile	Leu	Tyr	Glu	Pro	Gly	Glu	His	Pro	Asp	His	Val	Val		
	370					375					380						
Val	Ile	Lys	Tyr	Val	Pro	Tyr	Val	Gly	Asp	Ser	Lys	Arg	Ala	Met	Asp		
385					390					395					400		
Glu	Tyr	Thr	Ser	Glu	Ile	Phe	Met	Gly	Gly	Lys	Asn	Thr	Ile	Val	Leu		
				405					410					415			
His	Asn	Thr	Cys	Glu	Asp	Ser	Leu	Leu	Ala	Ala	Pro	Ile	Ile	Leu	Asp		
			420					425					430				
Leu	Val	Leu	Leu	Ala	Glu	Leu	Ser	Thr	Arg	Ile	Gln	Phe	Lys	Ala	Glu		
		435					440					445					

Asn Glu Gly Lys Phe His Ser Phe His Pro Val Ala Thr Ile Leu Ser
 450 455 460

Tyr Leu Thr Lys Ala Pro Leu Val Pro Pro Gly Thr Pro Val Val Asn
 465 470 475 480

Ala Leu Ser Lys Gln Arg Ala Met Leu Glu Asn Ile Met Arg Ala Cys
 485 490 495

Val Gly Leu Ala Pro Glu Asn Asn Met Ile Leu Glu Tyr Lys
 500 505 510

<210> 13
 <211> 1533
 <212> DNA
 <213> Glycine max

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 cagtggattg tcaaacccaa atccgtcaac taccaattta aaaccaacac ccatgttcca 180
 aaattggggg tgatgcttgt ggggtggggg ggaacaacg gctctaccct caccgggtgt 240
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 tactttggct ccctcaccca agcctcagct attcgagttg gatccttcca gggagaggaa 360
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 ggatgggata tcagcaacat gaacctggct gatgccatgg ccagggcaaa ggtgtttgac 480
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 aaagtggaca aggtggttgt cctgtggact gccaacacag agaggtatag caatttggtt 720
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 ttgattgggtg gagatgactt caagagtggg cagacccaaa tgaaatctgt gttggttgat 960
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 aatgatggta tgaatctctc ggctccacaa accttccgt ccaaggaaat ctccaagagc 1080
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 gacctgttg ttgttattaa gtatgtgcct tacgtagggg atagcaagag agccatggat 1200
 gagtacactt cagagatatt catgggtgga aagaacacca ttgttttgca caacacatgt 1260
 gaggattccc ttttagctgc tcctattatc ttggacttgg tccttcttgc tgagctgagc 1320
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 accattctca gctatctgac caaggctcct ctggttccac cgggtacacc agtgggtgaat 1440
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 <211> 510
 <212> PRT
 <213> Glycine max

<400> 14
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 Glu Thr Glu Ile Gln Ser Val Tyr Asn Tyr Glu Thr Thr Glu Leu Val
 20 25 30
 His Glu Asn Arg Asn Gly Thr Tyr Gln Trp Ile Val Lys Pro Lys Ser
 35 40 45

Val	Asn	Tyr	Gln	Phe	Lys	Thr	Asn	Thr	His	Val	Pro	Lys	Leu	Gly	Val	50	55	60	
Met	Leu	Val	Gly	Trp	Gly	Gly	Asn	Asn	Gly	Ser	Thr	Leu	Thr	Gly	Gly	65	70	75	80
Val	Ile	Ala	Asn	Arg	Glu	Gly	Ile	Ser	Trp	Ala	Thr	Lys	Asp	Lys	Ile	85	90	95	
Gln	Gln	Ala	Asn	Tyr	Phe	Gly	Ser	Leu	Thr	Gln	Ala	Ser	Ala	Ile	Arg	100	105	110	
Val	Gly	Ser	Phe	Gln	Gly	Glu	Glu	Ile	Tyr	Ala	Pro	Phe	Lys	Ser	Leu	115	120	125	
Leu	Pro	Met	Val	Asn	Pro	Asp	Asp	Ile	Val	Phe	Gly	Gly	Trp	Asp	Ile	130	135	140	
Ser	Asn	Met	Asn	Leu	Ala	Asp	Ala	Met	Ala	Arg	Ala	Lys	Val	Phe	Asp	145	150	155	160
Ile	Asp	Leu	Gln	Lys	Gln	Leu	Arg	Pro	Tyr	Met	Glu	Ser	Met	Val	Pro	165	170	175	
Leu	Pro	Gly	Ile	Tyr	Asp	Pro	Asp	Phe	Ile	Ala	Ala	Asn	Gln	Glu	Glu	180	185	190	
Arg	Ala	Asn	Asn	Val	Ile	Lys	Gly	Thr	Lys	Gln	Glu	Gln	Val	Gln	Gln	195	200	205	
Ile	Ile	Lys	Asp	Ile	Lys	Ala	Phe	Lys	Glu	Ala	Thr	Lys	Val	Asp	Lys	210	215	220	
Val	Val	Val	Leu	Trp	Thr	Ala	Asn	Thr	Glu	Arg	Tyr	Ser	Asn	Leu	Val	225	230	235	240
Val	Gly	Leu	Asn	Asp	Thr	Met	Glu	Asn	Leu	Leu	Ala	Ala	Val	Asp	Arg	245	250	255	
Asn	Glu	Ala	Glu	Ile	Ser	Pro	Ser	Thr	Leu	Tyr	Ala	Ile	Ala	Cys	Val	260	265	270	
Met	Glu	Asn	Val	Pro	Phe	Ile	Asn	Gly	Ser	Pro	Gln	Asn	Thr	Phe	Val	275	280	285	
Pro	Gly	Leu	Ile	Asp	Leu	Ala	Ile	Ala	Arg	Asn	Thr	Leu	Ile	Gly	Gly	290	295	300	
Asp	Asp	Phe	Lys	Ser	Gly	Gln	Thr	Lys	Met	Lys	Ser	Val	Leu	Val	Asp	305	310	315	320
Phe	Leu	Val	Gly	Ala	Gly	Ile	Lys	Pro	Thr	Ser	Ile	Val	Ser	Tyr	Asn	325	330	335	
His	Leu	Gly	Asn	Asn	Asp	Gly	Met	Asn	Leu	Ser	Ala	Pro	Gln	Thr	Phe	340	345	350	
Arg	Ser	Lys	Glu	Ile	Ser	Lys	Ser	Asn	Val	Val	Asp	Asp	Met	Val	Asn	355	360	365	

Ser Asn Ala Ile Leu Tyr Glu Pro Gly Glu His Pro Asp His Val Val
 370 375 380
 Val Ile Lys Tyr Val Pro Tyr Val Gly Asp Ser Lys Arg Ala Met Asp
 385 390 395 400
 Glu Tyr Thr Ser Glu Ile Phe Met Gly Gly Lys Asn Thr Ile Val Leu
 405 410 415
 His Asn Thr Cys Glu Asp Ser Leu Leu Ala Ala Pro Ile Ile Leu Asp
 420 425 430
 Leu Val Leu Leu Ala Glu Leu Ser Thr Arg Ile Gln Phe Lys Ala Glu
 435 440 445
 Asn Glu Gly Lys Phe His Ser Phe His Pro Val Ala Thr Ile Leu Ser
 450 455 460
 Tyr Leu Thr Lys Ala Pro Leu Val Pro Pro Gly Thr Pro Val Val Asn
 465 470 475 480
 Ala Leu Ser Lys Gln Arg Ala Met Leu Glu Asn Ile Met Arg Ala Cys
 485 490 495
 Val Gly Leu Ala Pro Glu Asn Asn Met Ile Leu Glu Tyr Lys
 500 505 510

<210> 15
 <211> 1533
 <212> DNA
 <213> Glycine max

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<210> 16
<211> 510
<212> PRT
<213> Glycine max

<400> 16

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Glu	Thr	Glu	Ile	Gln	Ser	Val	Tyr	Asn	Tyr	Glu	Thr	Thr	Glu	Leu	Val
			20					25					30		
His	Glu	Asn	Arg	Asn	Gly	Thr	Tyr	Gln	Trp	Ile	Val	Lys	Pro	Lys	Ser
		35					40					45			
Val	Asn	Tyr	Gln	Phe	Lys	Thr	Asn	Thr	His	Val	Pro	Lys	Leu	Gly	Val
	50					55					60				
Met	Leu	Val	Gly	Trp	Gly	Gly	Asn	Asn	Gly	Ser	Thr	Leu	Thr	Gly	Gly
65					70					75					80
Val	Ile	Ala	Asn	Arg	Glu	Gly	Ile	Ser	Trp	Ala	Thr	Lys	Asp	Lys	Ile
				85					90					95	
Gln	Gln	Ala	Asn	Tyr	Phe	Gly	Ser	Leu	Thr	Gln	Ala	Ser	Ala	Ile	Arg
			100					105					110		
Val	Gly	Ser	Phe	Gln	Gly	Glu	Glu	Ile	Tyr	Ala	Pro	Phe	Lys	Ser	Leu
		115					120					125			
Leu	Pro	Met	Val	Asn	Pro	Asp	Asp	Ile	Val	Phe	Gly	Gly	Trp	Asp	Ile
	130					135					140				
Ser	Asn	Met	Asn	Leu	Ala	Asp	Ala	Met	Ala	Arg	Ala	Lys	Val	Phe	Asp
145					150					155					160
Ile	Asp	Leu	Gln	Lys	Gln	Leu	Arg	Pro	Tyr	Met	Glu	Ser	Met	Val	Pro
				165					170					175	
Leu	Pro	Gly	Ile	Tyr	Asp	Pro	Asp	Phe	Ile	Ala	Ala	Asn	Gln	Glu	Glu
			180					185					190		
Arg	Ala	Asn	Asn	Val	Ile	Lys	Gly	Thr	Lys	Gln	Glu	Gln	Val	Gln	Gln
		195					200					205			
Ile	Ile	Lys	Asp	Ile	Lys	Ala	Phe	Lys	Glu	Ala	Thr	Lys	Val	Asp	Lys
	210					215					220				
Val	Val	Val	Leu	Trp	Thr	Ala	Asn	Thr	Glu	Arg	Tyr	Ser	Asn	Leu	Val
225					230					235					240
Val	Gly	Leu	Asn	Asp	Thr	Met	Glu	Asn	Leu	Leu	Ala	Ala	Val	Asp	Arg
			245					250						255	
Asn	Glu	Ala	Glu	Ile	Ser	Pro	Ser	Thr	Leu	Tyr	Ala	Ile	Ala	Cys	Val
			260					265					270		
Met	Glu	Asn	Val	Pro	Phe	Ile	Asn	Gly	Ser	Pro	Gln	Asn	Thr	Phe	Val
		275					280					285			

Pro	Gly	Leu	Ile	Asp	Leu	Ala	Ile	Ala	Arg	Asn	Thr	Leu	Ile	Gly	Gly	290	295	300	
Asp	Asp	Phe	Lys	Ser	Gly	Gln	Thr	Lys	Met	Lys	Ser	Val	Leu	Val	Asp	305	310	315	320
Phe	Leu	Val	Gly	Ala	Gly	Ile	Lys	Pro	Thr	Ser	Ile	Val	Ser	Tyr	Asn	325	330	335	
His	Leu	Gly	Asn	Asn	Asp	Gly	Met	Asn	Leu	Ser	Ala	Pro	Gln	Thr	Phe	340	345	350	
Arg	Ser	Lys	Glu	Ile	Ser	Lys	Ser	Asn	Val	Val	Asp	Asp	Met	Val	Asn	355	360	365	
Ser	Asn	Ala	Ile	Leu	Tyr	Glu	Pro	Gly	Glu	His	Pro	Asp	His	Val	Val	370	375	380	
Val	Ile	Lys	Tyr	Val	Pro	Tyr	Val	Gly	Asp	Ser	Lys	Arg	Ala	Met	Asp	385	390	395	400
Glu	Tyr	Thr	Ser	Glu	Ile	Phe	Met	Gly	Gly	Lys	Asn	Thr	Ile	Val	Leu	405	410	415	
His	Asn	Thr	Cys	Glu	Asp	Ser	Leu	Leu	Ala	Ala	Pro	Ile	Ile	Leu	Asp	420	425	430	
Leu	Val	Leu	Leu	Ala	Glu	Leu	Ser	Thr	Arg	Ile	Gln	Phe	Lys	Ala	Glu	435	440	445	
Asn	Glu	Gly	Lys	Phe	His	Ser	Phe	His	Pro	Val	Ala	Thr	Ile	Leu	Ser	450	455	460	
Tyr	Leu	Thr	Lys	Ala	Pro	Leu	Val	Pro	Pro	Gly	Thr	Pro	Val	Val	Asn	465	470	475	480
Ala	Leu	Ser	Lys	Gln	Arg	Ala	Met	Leu	Glu	Asn	Ile	Met	Arg	Ala	Cys	485	490	495	
Val	Gly	Leu	Ala	Pro	Glu	Asn	Asn	Met	Ile	Leu	Glu	Tyr	Lys	500	505	510			